



UNITED STATES PATENT AND TRADEMARK OFFICE

Sr
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,356	07/10/2003	Yasutaka Konno	520.42928X00	2366

20457 7590 03/23/2005

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

THOMAS, COURTNEY D

ART UNIT	PAPER NUMBER
----------	--------------

2882

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,356

Applicant(s)

KONNO ET AL.

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-8 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 07/10/03 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Drawings

2. Figures 2 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (note: Specification p. 9; - see also MPEP § 608.02(g)). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

4. Claim 2 is objected to because of the following informalities:

5. Claim 2 recites: The X-ray detector, wherein the transparent means ... has a shape in which an angle θ of a normal vector at an arbitrary point of a surface ... is 45 degrees $\leq \theta < 90$ degrees ... Based on Fig.7 of the instant application, Examiner concludes that the feature being claimed is the angle θ created between an input surface of the transparent means and an adjacent surface of the transparent means, such that the angle θ between the surfaces satisfies the relationship: 45 degrees $\leq \theta < 90$ degrees . Claim 2 as it is currently written, is ambiguous. Examiner suggests the claim be re-written to accurately capture the feature as shown in Fig. 7. By virtue of its dependency, claim 3 is similarly objected to.

6. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, Claim 1, (lines 22-24) recites the limitation: "... the area of said photo-electric means positioned on **the edge** (emphasis added) in said first direction..."

Art Unit: 2882

Examiner notes, that the phrase “the edge” does not have an antecedent basis and therefore adds ambiguity to the remainder of the claim (see also Claim 4, lines 8-9). Furthermore, it is unclear to the Examiner how the structure of a detector is attainable when the positioning of real elements (in this case, the (surface) area of the photo-electric means) is correlated with an arbitrary direction and not described in relation to other device elements.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1 and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Yoshida (U.S. Patent 6,393,092).

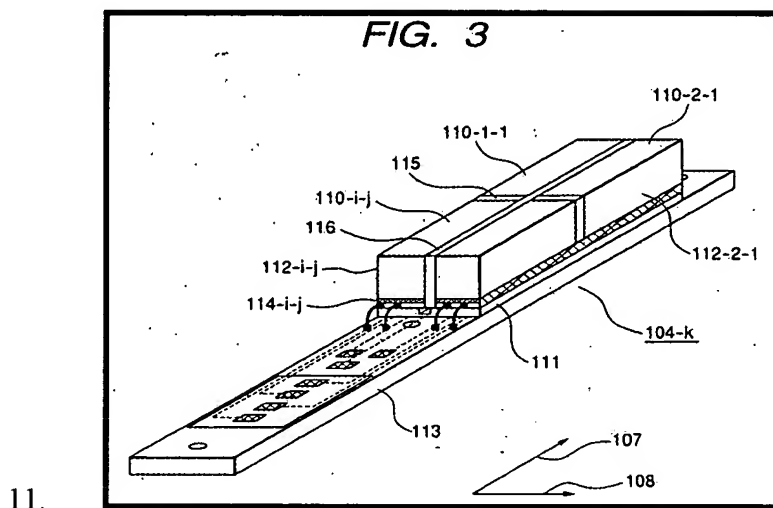


Figure 3 – X-ray Detector - AAPA - U.S. Patent Application 10/616,356; pp. 3-4 and 9

12. As per claims 1 and 4, Applicant's Admitted Prior Art (hereafter AAPA) discloses an X-ray detector (104) comprising: an X-ray sensitive module having a plurality of X-ray detecting

Art Unit: 2882

elements (110) having a scintillator (112) converting an X-ray into light via optical reflecting means (115, 116) in a first and second direction; a photo-electric module (111) containing photo-electric means (114) located in a two dimensional manner corresponding to the X-ray detecting elements; a distribution module (113) and module wiring means (not numbered, see Fig. 3 above) electrically connecting electrode pads (not numbered) of the photo-electric modules (111). Examiner notes that the discussion of the Prior art is not explicit in disclosing the presence of detection elements such as a) data lines - commonly understood as column address lines and b) (row) address lines - commonly understood as "scan lines" or simply "address lines" in the detection art. Examiner concludes that it would be understood by one having ordinary skill in the art that the aforementioned Prior Art X-ray detector possessed corresponding address and data lines for reading out electrical signals detected by the X-ray detecting elements (110). Examiner considers "electrode pads" as referring to electrical contact points within the device - which are not numbered, but illustrated in Fig. 3 above. Furthermore, Examiner treats similarly numbered elements (i.e. contrast Fig 1 (110) and Fig. 3 (110)) as functionally equivalent elements (see also Specification p. 39, lines 23-28). AAPA does not explicitly disclose a transparent means optically connected to a light output surface of a scintillator and a corresponding photoelectric means.

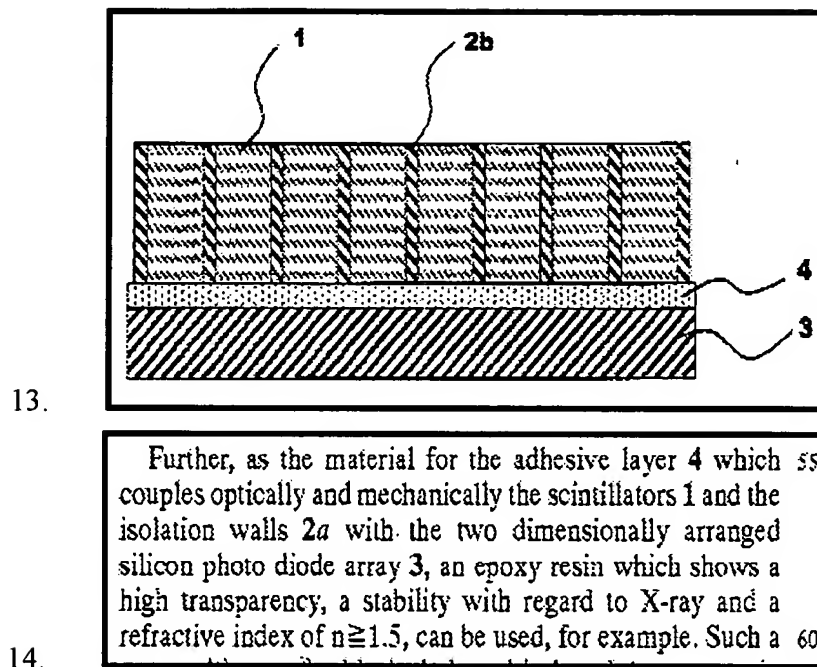


Figure 6 & column 9, lines 55-60 – U.S. Patent 6,393,092 to Yoshida

15. Yoshida discloses the utilization of a transparent means (4) for optical coupling of a scintillator output (1) and a corresponding photoelectric means (3). Yoshida teaches that the transparent means serves as an adhesive layer, providing mechanical stability and connectivity between the aforementioned elements, while displaying high transparency and stability in the presence of X-ray radiation. Yoshida suggests the transparency of the transparent means would not adversely affect detector resolution (see above, Fig. 6 and column 9, lines 55-60).

16. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the AAPA to incorporate a transparent means optically connected to a light output surface of a scintillator and a corresponding photoelectric means. One would have been motivated to make such a modification for the purpose of providing mechanical adhesion and connectivity between scintillator elements and photoelectric means, while

Art Unit: 2882

displaying high transparency and stability in the presence of X-ray radiation as suggested by Yoshida (see above, Fig. 6 and column 9, lines 55-60).

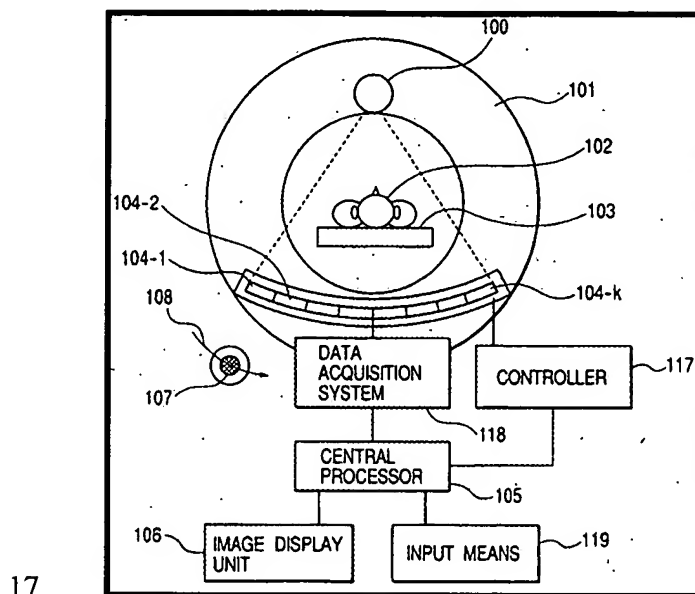


Figure 2 - X-ray CT Apparatus - AAPA - U.S. Patent Application 10/616,356; pp. 1-3 and 9

18. As per claims 5-8, AAPA as modified above, discloses an X-ray CT apparatus comprising an X-ray tube (100) a plurality of X-ray detectors (104) a data acquisition system (118), a detector control circuit (117), an arithmetic processing means (105) and an image display (106)- see Fig. 2 above and Specification pp. 1-3; 9; p. 39, lines 23-28.

Allowable Subject Matter

19. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. As per claim 2, the examiner found no reference in the prior art that disclosed or made obvious an X-ray detector comprising a transparent means having a shape in which an angle


θ created between an input surface of the transparent means and an adjacent surface of the transparent means satisfies the relationship: $45 \text{ degrees} \leq \theta < 90 \text{ degrees}$.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Courtney Thomas
Examiner
Art Unit 2882